Wave Propagation in the Magnetised Solar Atmosphere

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We have simulated the propagation of magneto-acoustic disturbances through various magneto-hydrostatic structures constructed to mimic the solar magnetic field. As waves propagate from regions of strong to weak magnetic field and vice-versa different types of wave modes (transverse and longitudinal) are coupled. In closed-field geometries we see the trapping of wave energy within loop-like structures. In open-field regions we see wave energy preferentially focussed away from strong-field regions.

We discuss these oscillations in terms of various wave processes seen on the Sun - umbral oscillations, penumbral running waves, internetwork oscillations etc.